33D CONGRESS, 2d Session. } HOUSE OF REPRESENTATIVES. { DOCUMENT No. 864.

MANTEO BAY, N. C.

LETTER

FROM

THE ACTING SECRETARY OF WAR,

TRANSMITTING,

WITH A LETTER FROM THE CHIEF OF ENGINEERS, REPORT ON PRELIMINARY EXAMINATION AND SURVEY OF MANTEO BAY, N. C., INCLUDING ITS APPROACHES, AND EXTENDING TO THE UPPER LIMITS OF THE TOWN OF MANTEO.

MARCH 27, 1914.—Referred to the Committee on Rivers and Harbors and ordered to be printed, with illustration.

WAR DEPARTMENT,
Washington, March 25, 1914.

The SPEAKER OF THE HOUSE OF REPRESENTATIVES.

SIR: I have the honor to transmit herewith a letter from the Chief of Engineers, United States Army, dated 24th instant, together with copies of reports from Maj. H. W. Stickle, Corps of Engineers, dated May 15, 1913, and February 17, 1914, with map, on preliminary examination and survey, respectively, of Manteo Bay, N. C., made by him in compliance with the provisions of the river and harbor act approved March 4, 1913.

Very respectfully,

HENRY BRECKINRIDGE,
Acting Secretary of War.

WAR DEPARTMENT,
OFFICE OF THE CHIEF OF ENGINEERS,
Washington, March 24, 1914.

From: The Chief of Engineers, United States Army.
To: The Secretary of War.
Subject: Preliminary examination and survey of Manteo Bay, N. C.

1. There are submitted herewith, for transmission to Congress, reports dated May 15, 1913, and February 17, 1914, with map, by Maj. H. W. Stickle, Corps of Engineers, on preliminary examination

and survey, respectively, of Manteo Bay, N. C., including its approaches, and extending to the upper limits of the town of Manteo, authorized by the river and harbor act approved March 4, 1913.

2. Manteo Bay, or Shallowbag Bay, is on the northeastern side of Roanoke Island. By the act of June 25, 1910, a project was adopted for improvement of Shallowbag Bay, providing for a channel 100 feet wide and 6 feet deep at mean low water from the entrance of the bay to the wharves at Manteo. This project has been completed, but some maintenance work will be required to make the project depth available. There is no lunar tide at this locality, but the district officer reports that there are times, especially during the winter, when the depth ordinarily available is lowered by winds, and during such times navigation is practically closed to boats drawing more than $4\frac{1}{2}$ to 5 feet of water. The improvement apparently desired is a channel capable of being used at all times by boats drawing 6 feet of water. The commerce of the locality, which is necessarily entirely by water, has shown a substantial increase as a result of the facilities provided by the United States, and the district officer is of opinion that further improvement is advisable to the extent of dredging an approach channel in Manteo Bay 100 feet wide and 7 feet deep, and a channel or basin 200 feet wide and 7 feet deep to the upper limits of the town of Manteo, at a total estimated cost of $28,000, provided the right to dredge the marshland within the limits of the basin and to deposit material on adjacent marshland be granted free of cost to the United States. The division engineer concurs with the district officer in believing that the General Government is justified in undertaking the work proposed.

3. These reports have been referred, as required by law, to the Board of Engineers for Rivers and Harbors, and attention is invited to its report herewith, dated March 11, 1914, concurring with the views of the district officer and the division engineer.

4. After due consideration of the above-mentioned reports, I concur with the views of the district officer, the division engineer, and the Board of Engineers for Rivers and Harbors, and therefore report that the improvement by the United States of Manteo Bay, N. C., is deemed advisable to the extent of providing an approach channel feet deep and 100 feet wide, with a small basin in front of the marine railway, and thence a channel or basin of the same depth and 20 feet wide to the upper limits of the town of Manteo, as shown on accompanying map, at an estimated cost of $28,000 for first construction and $2,000 annually for maintenance, provided that no expense shall be incurred by the United States for acquiring any land required for the purpose of this improvement. The full amount of the estimated first cost should be provided in one appropriation.

DAN C. KINGMAN,
Chief of Engineers, United States Army.

EPORT OF THE BOARD OF ENGINEERS FOR RIVERS AND HARBORS ON SURVEY.

[Third indorsement.]

BOARD OF ENGINEERS FOR RIVERS AND HARBORS,
March 11, 1914.

he CHIEF OF ENGINEERS, UNITED STATES ARMY.

1. Manteo Bay lies on the eastern side of Roanoke Island. The wn of Manteo is the county seat of Dare County and has a popula- on of 600, while Roanoke Island has a population of 3,000. It is ated that the town of Manteo is the distributing point for a large ction of country adjacent, in addition to that immediately on oanoke Island, and it is estimated that 10,000 people do most of eir trading through Manteo. Elizabeth City, some 43 miles distant, the nearest railroad station.

2. There is no lunar tide to affect the water surface, but it is subject considerable variation, due to winds.

3. The present project, which is now complete, provides for a chan- el 100 feet wide and 6 feet deep at mean low water, but the depth vailable is at times about 1 foot less, due to the lowering of the water rface by wind action, so that only boats drawing not more than $4\frac{1}{2}$ 5 feet can be used at all times.

4. The commerce of the locality has been increasing and now nounts to about 18,000 tons, having a value of $1,000,000. It con- sts principally of fish, oysters, clams, truck, and general merchandise.

5. It is claimed that boats of the limited draft afforded by the resent channel can not safely and economically navigate Albemarle ound, and the improvement desired is a sufficient increase in depth provide for an assured draft of 6 feet at all times.

6. The board was not convinced by the information presented in ie report on preliminary examination of the advisability of additional nprovement, and interested parties were so informed and given an pportunity of presenting further evidence. This resulted in a hear- g before the board on June 30, 1913, which was attended by Hon. ohn H. Small, M. C., and a representative of the locality. Special ress was laid upon the inadequacy of the present project depth on ccount of the depression of the water surface at times. A survey as recommended and has been made.

7. It has been found from investigations made in connection with ie survey that while the water surface does at times reach a stage elow the mean low-water plane, such periods are infrequent and of ort duration, and that the present established plane is fairly ac- urate. Eliminating the work to be done to restore the project epth, for which funds are available, the estimated cost of a channel feet deep and 100 feet wide, enlarging into a channel 200 feet wide n front of the town of Manteo and including a small basin in front f the marine railway, is estimated to cost $28,000, with an annual aintenance of $2,000.

8. The district officer is of opinion that additional improvement to his extent is worthy of being undertaken by the United States, pro- ided the right to dredge the marshlands shown within the limits of he basin and to deposit material on adjacent marshlands be granted ree of cost to the United States. The division engineer concurs.

9. A study of the facts now before the board indicates the need of some increased depth at this locality in order to permit the use of stanch boats of sufficient draft to weather the seas on Albemarle Sound. Such draft appears to be 6 feet, and in order to provide for this, a project depth of 7 feet is deemed necessary. The commerce of the locality has been increasing in recent years, and this growth may reasonably be expected to continue if adequate navigation facilities are provided. The locality is by virtue of its geographic position dependent entirely upon water transportation, and for this reason the board believes that the need for providing adequate navigation facilities is specially urgent.

10. In view of the foregoing, the board concurs with the district officer and the division engineer in recommending a modification of the existing project to provide for a channel of approach 7 feet deep and 100 feet wide, enlarging in front of the town of Manteo, as shown upon the accompanying map, at an estimated total cost of $28,000, with an annual maintenance charge of $2,000, provided that no expense shall be incurred by the United States for acquiring any lands required for the purpose of this improvement. The total estimated first cost should be made available in one appropriation.

11. In compliance with law, the board reports that there are no questions of terminal facilities, water power, or other subjects so related to the project proposed that they may be coordinated therewith to lessen the cost and compensate the Government for expenditures made in the interests of navigation.

For the board:

FREDERIC V. ABBOT,
Colonel, Corps of Engineers,
Senior Member Present.

PRELIMINARY EXAMINATION OF MANTEO BAY, N. C.

WAR DEPARTMENT,
UNITED STATES ENGINEER OFFICE,
Wilmington, N. C., May 15, 1913.

From: The District Engineer Officer.
To: Chief of Engineers, United States Army
(Through the Division Engineer).
Subject: Preliminary examination of Manteo Bay, N. C.

1. This is a report of the preliminary examination of Manteo Bay N. C., including its approaches, and extending to the upper limits o the town of Manteo, provision for which was made in the river an harbor act approved March 4, 1913. The duty of making this pre liminary examination was assigned to me by department letter o March 18, 1913.

2. Manteo Bay, or Shallowbag Bay, is a small, well-inclosed ba on the eastern side of Roanoke Island. This island separates Croata and Roanoke Sounds, lying between the eastern end of the peninsul formed by Albemarle and Pamlico Sounds and the barrier beach o the Atlantic coast of North Carolina. The bay is near the norther end of the island and Manteo, the county seat of Dare County, located at its head.

3. There is a population of about 600 living within a radius of 1 mi from the courthouse in the town of Manteo, and a population

bout 3,000 living on Roanoke Island. These figures do not give a orrect idea of its commercial importance, as it is the only town of ny size in Dare County, and all the post offices in the county are upplied from it. It is estimated that 10,000 people do most of their rading through Manteo.

4. Dare County consists of three principal sections, each of which separated from the other by large bodies of water, the larger sec- on being that portion on the mainland and included between Alli- ator River and Croatan Sound, the second being Roanoke Island nd the third being the barrier beach, extending from the point oppo- te the middle of Albemarle Sound south of Hatteras Inlet. Of ne total area of the county, at least one-half is water.

5. One of the principal occupations of the people of Roanoke sland is fishing, and nearly all the fish caught are shipped from Manteo. There are two other shipping points on the island, Skyco nd Wanchese, but these ports are unprotected, Manteo being the nly one that can be relied upon at all times.

6. About 4 miles northeast of Manteo, on the beach, is Nags Head, a summer resort, patronized by people from Elizabeth City, denton, Hertford, and other towns in the northeastern part of the tate. Elizabeth City, 43 miles northwest, is the nearest railroad cation, and has daily boat service to Nags Head and Manteo. By eason of its insular position this boat line is the only method of ransportation that can be established as an outlet for the commerce f Roanoke Island, and the eastern portion of Dare County. Twenty- ve miles of the route traversed by it lies through the wide reaches f Albemarle Sound, where it is exposed to, and at the mercy of, igh winds from any direction. The conditions of draft at the ntrance of Shallowbag Bay are such that small boats are necessarily sed on this route. Washington, N. C., is 115 miles to the southwest.

7. There is practically no lunar tide at this point, variations in ater level being entirely due to prevailing winds, the northerly inds prevalent from December to April causing low tides, and the outherly winds prevalent from June to October causing high tides. he mean stage for the winter months is approximately 1 foot below ne annual mean stage, while that for the summer months is as much bove.

8. The present and only project for improvement (Shallowbag Bay) as adopted by the river and harbor act approved June 25, 1910, and rovided for securing a channel by dredging 100 feet wide and 6 feet eep at mean low water from the entrance of the bay to the wharves t Manteo, at an estimated cost of $13,750, with $2,000 annually or maintenance. By authority the channel was extended up Doughs reek along the eastern front of the town of Manteo with funds vailable from this appropriation a distance of 1,355 feet.

9. The locality and conditions are shown on map,[1] which is here- ith prepared in connection with this examination.

10. The only previous preliminary examination of this locality is eported in House Document No. 906, Sixtieth Congress, first session. hat report led to a survey on which the appropriation for improve- ent referred to in paragraph 7 was based.

11. The annual commerce of this waterway is shown by the table llowing.

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[1] Not printed.

Year.	Amount in short tons.	Valuation.
1910	10,513	$563,36
1911	13,194	680,20
1912	18,244	1,059,84

In the commercial statistics for the year 1910 and 1911, the items o fish, clams, and oysters, which are collected and brought into Mantec in small boats to be later shipped in larger boats, were counted onl once, though moved twice over the waterway, while for 1912 the were counted twice. If the 1911 statistics were tabulated on th same basis as those for 1912, an increase of 11 per cent in the tonnag and 7 per cent in the valuation would be noted.

The following table gives the detailed commercial statistics for th calendar year 1912:

Commercial statistics, Shallowbag Bay.

[Navigable the entire year.]

Classes.	Number.	Net registered tonnage.	Passenge
AMERICAN.			
Registered:			
Sailing	12	144	9,(
Gasoline	10	75	
Total	22	219	9,(

FREIGHT TRAFFIC.

Articles.	Amount.	Amount, in short tons.	Valuatic
INBOUND.			
Brick ..... number..	75,000	187	$1
Clams ..... bushels..	550	27	
Coal ..... tons..	250	250	1,
Cotton-seed meal ..... do....	40	40	1,
Fertilizers ..... do....	450	450	13,
Fish, fresh ..... boxes..	35,000	3,500	350,
General merchandise ..... tons..	2,000	2,000	300,
Grain ..... bushels..	16,000	400	8,
Hay ..... tons..	500	500	10,
Horses ..... head..	60	30	6,
Lumber ..... feet b. m..	850,000	1,700	17,
Machinery ..... tons..	30	30	3
Oysters ..... bushels..	1,200	48	
Peanuts ..... do....	200	3	
Potatoes ..... do....	1,500	20	
Shingles ..... number..	450,000	225	2
Tar ..... barrels..	800	120	1
Wood ..... cords..	400	400	1
Ice ..... tons..	3,000	3,000	21
		14,290	740
OUTBOUND.			
Cattle ..... head..	60	15	1
Clams ..... bushels..	450	23	
Eggs ..... crates..	300	7	1
Fish, fresh ..... boxes..	30,000	3,000	30
Hogs ..... head..	200	10	
Oysters ..... bushels..	500	20	
Poultry ..... head..	9,000	18	
Peanuts ..... bushels..	450	6	
Potatoes ..... do....	6,000	180	
Vegetables ..... packages..	1,500	75	
Wood ..... cords..	600	600	
		3,954	31

Fish, clams, and oysters are collected and brought in in small boats o be later exported in larger boats, and are shown above both as nport and export. It is to be noted that fish constitutes over 60 er cent of the valuation of the commerce of the locality.

The statistics for the year 1906 show less than 200 tons, with a valation of $121,208. A comparison of statistics for the four years or which records are available indicates that the improvement lready provided by the Government has developed a commerce ntirely sufficient to justify the improvement, and that the comnerce is steadily increasing from year to year; the valuation of comnerce last year being nearly nine times that for 1906.

12. At mean low water there is 6 feet depth of water to the wharves t Manteo as called for by the present project, but since for four or ve months in the winter season the available depth is about a foot ess, navigation is practically closed for that time to boats drawing nore than 4½ to 5 feet of water. Outside the bay the sound is shalow and the slope of the bottom gradual. It is about 3 miles from he wharves at Manteo through the bay to a depth of 8 feet outside. The bottom appears to be stable and the dredging already done eems to have maintained itself with little if any shoaling. There re no swift currents in the sound or bay.

13. On account of shallow water large boats, with suitable facilties for icing, can not be used in the fishing business, whereas with nore water larger boats could be used and it is probable that regular hipments from Manteo would be developed without rehandling at Elizabeth City.

14. In the preliminary examination report on Shallowbag Bay, lated August 21, 1907, appears the statement: "It might be worth while to mention in this connection that Shallowbag Bay is very near he proposed route for the inland waterway from Norfolk to Beaufort Harbor, N. C., where it passes from Albemarle to Croatan Sound. f the commerce on this inland route ever amounts to anything, this ay, which is the only landlocked harbor on the route through the ounds, will certainly increase in importance." Since that report vas written the Norfolk-Beaufort waterway has been determined pon and its adopted location brings it near to Manteo, and the suggested increase in importance of Manteo Bay seems certain to naterialize.

15. A hearing was held at Manteo May 6, 1913, in connection with his preliminary examination. It was well attended by interested parties from Manteo, Elizabeth City, and Wanchese. Record of nearing is herewith. At the hearing it was stated:

(*a*) That large quantities of fish are caught that are thrown on the fields for fertilizer n account of lack of shipping facilities.

(*b*) That soil and climate make the island an ideal place for truck crops and they vould be grown if quick and certain transportation to markets were assured.

(*c*) That increasing numbers of people from the interior would have summer cotages on the beach at Nags Head if larger boats providing greater comfort and safety could be used.

(*d*) That a saving in freight rates on some items of commerce could be made by bringing them in cargo lots from Norfolk through the Norfolk-Beaufort waterway n vessels drawing 6 feet, provided these vessels could at all times come to the town of Manteo.

(*e*) That capital is now awaiting an assurance of adequate depth of water in the harbor and in the channel leading thereto to install at Manteo an ice plant of 50 tons

capacity per day, a freezer of 20,000 barrels of 300 pounds each, storage room, and 40,000 pounds daily fish refrigeration, and a canning factory for oysters, clams, and crabs.

16. It is the desire of the parties interested that a channel 150 feet wide be provided from the sound to the town of Manteo, capable of being used at all times by boats drawing 6 feet of water. From the tidal conditions mentioned above it will be seen that this channel should have a depth of 8 feet at mean low water. They desire further to have a portion of the present channel lying in Dough Creek, along the eastern side of the town, made 200 feet wide, so it can be used as a turning basin, and a spur channel leading from the main channel along the southern front for a distance of about 150 yards. I do not recognize any necessity for the approach channel to exceed 100 feet in width provided it be properly marked, and think any funds which may be expended in improvement here had better be applied to increasing depth rather than to increasing width. It was expected by the Board of Engineers for Rivers and Harbors, as noticed in third indorsement April 20, 1908, House Document No. 906, Sixtieth Congress, first session, that the execution of the present approved project would result in securing a 7-foot channel on account of provision being made in the estimate for 1 foot over depth. This additional foot was not actually secured throughout. It is hardly practicable from data at hand at this time to express an opinion as to the extent of improvement by the General Government advisable in the main channel, in the construction of a turning basin, or in the construction of the proposed spur channel to the marine railway. Estimates of cost for channels 7 feet and 8 feet deep are to be found in the previous report on survey of Shallowbag Bay, and I believe the figures therein may be relied upon at the present time as far as the main channel is concerned.

17. The wharves at Manteo number 17. Photographs of each of the wharves, with individual descriptions, and map showing location of each were forwarded with my report on "Water terminal and transfer facilities; Shallowbag Bay, N. C., dated January 29, 1913." The have a total frontage of 837 feet. The height of decking above water varies from 1 foot to 4 feet, and the available depths of water at the wharves vary from 1 foot to 5 feet. Twelve wharves are provided with warehouses, the total warehouse floor area being 12,405 square feet. None of the wharves are provided with mechanical equipment to load or unload vessels. The wharves are used principally for boat landings and for unloading general merchandise. The warehouses are used principally for storage of general merchandise, fishing supplies and as fish houses. The condition of the wharves and warehouses ranges from very poor to good, the general condition being fair. All of the wharves are open to all water carriers free of charge. None of them have physical connection with a railroad. Improved and adequate highways have been constructed to 12 of the water terminals and three are without highways.

The Eastern Carolina Transportation Co., which operates the boat line between Elizabeth City and Manteo, has a contract with the Norfolk Southern Railroad for prorating freight rates on long-distance tariffs carried partly by rail and partly by water. Through tariffs are published and on file with the Interstate Commerce Commission,

overed by power of attorney and concurrence, which are also on file ith the commission.

Existing terminal and transfer facilities are considered adequate to neet the needs of present commerce. It is probable that the construction of private terminals will keep abreast of the needs of commerce as it may develop.

18. In connection with the proposed improvement there are no ossibilities for the development and utilization of water power for ndustrial and commercial purposes.

19. There is no possibility of coordinating this improvement for avigation with improvements desirable for other purposes, so as to ompensate the Government for expenditures made in the interest f navigation.

20. Having in mind the fact that this locality is entirely dependent n water transportation and the probability that commercial benefits vill accrue from deeper channels, I would recommend a survey to letermine the extent to which improvement by the General Government may be advisable.

H. W. STICKLE,
Major, Corps of Engineers.

[First indorsement.]

OFFICE DIVISION ENGINEER, SOUTHEAST DIVISION,
May 19, 1913.

To the CHIEF OF ENGINEERS:

1. I agree with the district officer that this locality is worthy of a survey to determine the cost of an adequate improvement.

2. I am of the opinion, however, that 100 feet is too narrow for a channel in broad water. I think that the channel should be at least 150 feet wide, and I would advise that in making the survey an estimate of the cost of creating a channel having a navigable depth of 7 feet, and also one having a navigable depth of 10 feet, be prepared and submitted.

DAN C. KINGMAN,
Colonel, Corps of Engineers.

[Third indorsement.]

BOARD OF ENGINEERS FOR RIVERS AND HARBORS,
July 1, 1913.

To the CHIEF OF ENGINEERS, UNITED STATES ARMY:

For reasons stated herein the board concurs with the district officer and the division engineer in recommending a survey in order to determine the advisability of the improvement. It is the opinion of the board that under the existing physical conditions no greater depth than 7 feet at mean low water, referred to the present datum plane, is feasible at reasonable cost, and it is recommended that the estimate be based on that depth.

For the board:

W. M. BLACK,
Colonel, Corps of Engineers,
Senior Member of the Board.

SURVEY OF MANTEO BAY, N. C.

WAR DEPARTMENT,
UNITED STATES ENGINEER OFFICE,
Wilmington, N. C., February 17, 1914.

From: The District Engineer Officer.
To: The Chief of Engineers, United States Army
(Through the Division Engineer).
Subject: Report of survey of Manteo Bay, N. C.

1. In compliance with instructions contained in department letter dated July 7, 1913, the following report of the survey of Manteo Bay, N. C., including its approaches and extending to the upper limits of the town of Manteo, is submitted:

2. Assistant Engineer Harry T. Paterson, to whom the immediate charge of this survey was assigned, reports as follows:

The survey was made in December, 1913, by a party under Junior Engineer Norman M. Chivers, and consisted in taking soundings for the purpose of locating the most feasible channel and making estimates of the amount of material to be removed. On hydrographic base lines stakes were set, usually at 400-foot intervals, and soundings were located by measurement with a graduated wire at intervals on ranges run at right angles from these stakes.

Shore lines, wharves, and topography were taken with the plane table, using data furnished by the United States Coast and Geodetic Survey for horizontal control. Soundings are referred to the assumed mean low water of the 1908 survey, the plane of reference of the existing improvement. A gauge was established at Manteo on August 14, 1913, with its zero at this datum, and daily readings have been taken since that time. The monthly averages, together with the prevailing direction of the wind, are shown in the following table:

	Prevailing direction of wind.	Average gauge reading, in feet.
Aug. 14 to 31	NE.	0.
Sept. 1 to 30	NE.	.
Oct. 1 to 31	NW.	.
Nov. 1 to 30	NE.	.
Dec. 1 to 18	NW.	.

There were 10 days in the above period when the water stage was below zero on this gauge, on two of which it was 0.1 below; two days when it was 0.2 below, and two days when it was 0.3 below; the other readings being 0.6, 0.7, 0.9, and 1.5 below. The last two readings were taken on September 2 and 3, at which time the severest storm of the past 20 years occurred.

A full year's observation on this gauge from which to establish the plane of reference is not available. It will be seen from the above, however, by eliminating the days on which the variation was only two-tenths or less, as being too small to have an appreciable influence on conditions of navigation, and eliminating also those readings taken during the exceptional storm, that on 4 days of the 127 covered by the table was the water stage below the datum plane used. The lowest monthly average is 0. above datum, and all the monthly averages given are for months when the prevailing wind is from the northerly quadrants, from which it would appear that the datum used will conform closely to that required. Gauge readings are being continued to fill out the yearly record. Cape Hatteras is less than 50 miles to the southward, and the wind diagram, prepared in connection with the survey of Cape Channel, would be fairly representative of conditions at Manteo.

3. There are no physical or commercial changes to note since the preliminary examination report was submitted.

4. It will be noticed from the accompanying map that the full project depth of the existing improvement, i. e., 6 feet, is not avail

ble at all places. It is estimated that 7,000 cubic yards would have o be removed to restore the project depth, and funds are available or this work, which will be done as soon as suitable plant can be ecured. This amount has been deducted from the estimates which llow in order to give the cost of additional improvement.

5. The proposed extension to the "upper limits of the town of Manteo" can not be regarded as entirely free from a local or terminal nprovement character. Under the existing project, however, a hannel was dredged up Doughs Creek in front of the wharves to early if not quite to the limit of the basin, as shown on the drawing. f no basin for turning were provided, the approach channel improvement could not be of great advantage. If the turning basin were onstructed just at the head of the approach channel, the East Carona Transportation Co. would be the direct beneficiary of the improvement, and other interests might be damaged as competition ight be eliminated. Although to some extent local in character, he dredging of the basin both up Doughs Creek and toward the arine railway would undoubtedly give a great impetus to the gen-ral commerce of Manteo. The cost of the basin as shown below is omparatively small, but the financial resources of the community re limited, and it is not deemed practicable to include in this improvement cooperation beyond holding the United States free from any xpense on account of dredging through existing marshland, as shown, nd furnishing suitable places for deposit of dredged material free of harge.

6. The following is the estimated cost of the improvement proosed, the complete removal of 1 foot overdepth being allowed for ver the entire area:

[. Entrance channel 100 feet wide:		
Material to be removed from section	cubic yards	35,000
Material to be removed from 1 foot overdepth	do	49,000
Total material to be removed	do	84,000
Unit price	cents	20
Cost of dredging		$16,800
Superintendence and contingencies		1,700
Total cost		18,500
Estimated annual maintenance		1,200
I. Channel to the upper limits of the town of Manteo, 200 feet wide:		
Material to be removed from section	cubic yards	30,000
Material to be removed from 1 foot over depth	do	13,000
Total material to be removed	do	43,000
Unit price	cents	20
Cost of dredging		$8.600
Superintendence and contingencies		900
Total cost		9.500
Estimated annual maintenance		800

This would make the total cost of dredging the channel and channel n front of the town, as shown, to a depth of 7 feet, $28,000, with an nnual maintenance estimated at $2,000. In this estimate side slopes f 1:2.5 have been assumed, apparently justified by the character of naterial to be removed, which is principally sand with some mud.

7. It is believed that the plan proposed will meet the needs of the community for some time to come, as it will provide a channel capable of being used about 97 per cent of the time by vessels of 6-foot draft. Vessels of large size, that combine seaworthiness with large cargo capacity, can be secured within this limitation.

8. As noted in paragraph 11 of the preliminary examination report, a great increase in the volume and valuation of the commerce has followed the existing improvement. It seems certain that a similar increase will follow the additional improvement proposed, and, as the community is and always will be entirely dependent on water transportation, it is believed that the project above outlined is worthy of being undertaken by the General Government.

9. It is therefore my opinion that the improvement of Manteo Bay by dredging of an approach channel 100 feet and a channel to the upper limits of the town of Manteo, as shown on plan accompanying this report, all to a depth of 7 feet, at a total estimated cost of $28,000 with annual maintenance of $2,000, is worthy of being undertaken by the United States, provided the right to dredge out the marsh land shown within the limits of the basin and to deposit material on adjacent marsh land be granted free of cost to the United States. The minimum depth of 7 feet and the minimum width of 100 feet, as proposed for the entrance channel, are considered suitable for boats having a maximum draft of 6 feet, for which the channel is designed. The width of 200 feet proposed in front of the town of Manteo is to provide a convenient approach to and departure from the wharves at Manteo.

10. If this improvement should be ordered, funds sufficient to cover the entire cost should be provided in the initial appropriation, in order that the work may be prosecuted at the rate of 25,000 cubic yards per month. The plan recommended could then be completed in about five months' work.

H. W. STICKLE,
Major, Corps of Engineers.

[First indorsement.]

OFFICE DIVISION ENGINEER, SOUTHEAST DIVISION,
February 25, 1914.

To the CHIEF OF ENGINEERS:

Based on the present tonnage and past expenditures, the cost of the project herein submitted could hardly be justified; but, considering the isolated situation of the community, the rapid increase of commerce in the past few years, and the prospect of continuing increase in the future, it is believed the General Government is justified in undertaking the work proposed by the district officer, and I therefore concur in his recommendation expressed in paragraph 9 of the report.

W. C. LANGFITT,
Colonel, Corps of Engineers.

[For report of the Board of Engineers for Rivers and Harbors on survey, see p. 3.]

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WAR DEPARTMENT

CORPS OF ENGINEERS U. S. ARMY

AZIMUTH

AZIMUTH IS TRUE AT C. & G. S. STATION MANTEO (NOT SHOWN ON MAP)
PROJECTION PLANE NOT CORRECTED FOR CONVERGENCE OF MERIDIAN

FROM C. & G. S. STATION MANTEO	TO WANCHESE CHURCH SPIRE	07°10'.38"
	NCS HEAD LIFE SAVING STA CUPOLA	206-18 31
	TO MANTEO COURT HOUSE FLAG POLE	124 18 40
	TO U. S. E. D. STA BALLAST POINT	153-43 28
FROM MANTEO COURT HOUSE	TO U. S. E. D. STA BALLAST POINT	338 30-43
	TO U. S. E. D. STA BAUMS PT	322-30-55
	TO U. S. E. D. STA SCARBORO	314-16-30
FROM U. S. E. D. BALLAST PT	TO MANTEO COURT HOUSE FLAG POLE	68-30-49
	TO U. S. E. D. STA BAUMS POINT	132-21-53
	TO U. S. E. D. STA SCARBORO	97-58-58
FROM U. S. E. D. STA BAUMS PT	TO U. S. E. D. STA BALLAST POINT	312-31-53
	TO U. S. E. D. SCARBORO	06-07-23
FROM U. S. E. D. SCARBORO	TO MANTEO COURT HOUSE FLAG POLE	42-10 53
	TO U. S. E. D. STA BALLAST POINT	327-55-50
	TO U. S. E. D. STA BAUMS PT	180-07-31
	TO MANTEO COURT HOUSE	134-16-38

DISTANCES

FROM C. & G. S. STA MANTEO	TO MANTEO COURT HOUSE	12417.1 FT
FROM MANTEO COURT HOUSE	TO U. S. E. D. STA BALLAST PT	6723.8 "
FROM MANTEO COURT HOUSE	TO " " BAUMS POINT	4659.1 "
FROM MANTEO COURT HOUSE	TO " " SCARBORO	3515 8 "
FROM U. S. E. D. STA BALLAST PT	TO " " STA BAUMS PT	4886.6 "
FROM U. S. E. D. STA BALLAST PT	TO " " STA SCARBORO	4958 5 "

VERTICAL CONTROL

SOUNDINGS ARE EXPRESSED IN FEET AND TENTHS AND ARE REFERRED TO THE ASSUMED MEAN LOW WATER OF THE 1908 SURVEY

B. M. NO. 1 IS A CROSS MARK CUT IN THE NORTH END OF THE FIRST STEP OF DARE COUNTY COURT HOUSE. ELEVATION 9.481 FEET

B. M. NO. 2 IS A CROSS MARK CUT IN NORTH END COURT HOUSE PORCH 1.8 FEET FROM BUILDING AND 0.3 FEET FROM EDGE OF PORCH. ELEVATION 9.865 FEET

DESCRIPTIONS

TRIANGULATION STATION BALLAST POINT IS A CONCRETE MONUMENT MARKED U. S. E. D. 1913.
TRIANGULATION STATION BAUMS POINT IS A CONCRETE MONUMENT MARKED U. S. E. D.
TRIANGULATION STATION SCARBORO IS A CONCRETE MONUMENT MARKED U. S. E. D. 1914

MANTEO BAY, N. C.

INCLUDING ITS APPROACHES, AND EXTENDING TO THE UPPER LIMITS OF THE TOWN OF MANTEO, DARE COUNTY, NORTH CAROLINA.

FROM SURVEY OF DECEMBER 1913 UNDER THE DIRECTION OF
MAJOR H. W. RITCHIE, CORPS OF ENGINEERS, U. S. ARMY
BY T. PATERSON ASSISTANT ENGINEER

FIELD WORK BY
NORMAN W. CHILDS, JUN. ENG.
T. J. HEWITT, INSPECTOR

OFFICE WORK BY
NORMAN W. CHILDS, JUN. ENG.
T. J. HEWITT, INSPECTOR
ALFRED IOE MILLER, JUN. ENG.

Court House Flag Pole

Ballast Point USED 1913

Scale of feet
1000 500 0 1000 2000

U. S. ENGINEER OFFICE, WILMINGTON, N. C.
FORWARDED TO THE CHIEF OF ENGINEERS U. S. ARMY
WITH REPORT OF FEB. 17, 1914.

WALTER KOPPE OF ENGINEERS U. S. ARMY

House Doc. No. 864 : 63d Cong., 2d Sess.